

Ogreeta, North Carolina, 24th.
 Wilmington, North Carolina, 17th.
 Memphis, Tennessee, 19th.
 Nashville, Tennessee, 18th to 21st.
 Cleburne, Texas, 10th.
 Fort Canby, Washington Territory, 29th.

Table of rainy and cloudy days, relative humidity, and dew-point for Dec., 1883.

Districts.	Rainy days.	Cloudy days.	Rel. humidity.	Dew-point.
	From 13 to 21	From 9 to 13	Percentages.	°
New England.....	From 13 to 21	From 9 to 13	From 73.3 to 80.5	From 16.8 to 29.5
Middle Atlantic states.....	" 11 " 21	" 5 " 16	" 63.0 " 78.4	" 22.4 " 37.2
South Atlantic states.....	" 3 " 15	" 1 " 8	" 60.6 " 81.6	" 35.3 " 52.6
Florida peninsula.....	" 4 " 8	" 1 " 2	" 76.7 " 79.2	" 54.2 " 64.3
East Gulf states.....	" 10 " 16	" 8 " 12	" 70.8 " 75.6	" 43.7 " 50.6
West Gulf states.....	" 7 " 14	" 8 " 12	" 67.2 " 81.3	" 32.0 " 53.2
Rio Grande valley.....	" 7 " 10	" 9 " 10	" 78.0 " 84.8	" 53.0 " 59.6
Ohio valley.....	" 16 " 17	" 9 " 16	" 68.1 " 78.1	" 24.5 " 32.6
Tennessee.....	" 16 " 18	" 8 " 16	" 68.8 " 73.6	" 35.6 " 37.4
Lower lakes.....	" 17 " 25	" 8 " 24	" 67.0 " 80.4	" 20.8 " 27.9
Upper lakes.....	" 11 " 23	" 7 " 26	" 70.2 " 82.7	" 9.2 " 21.5
Extreme northwest.....	" 6 " 16	" 4 " 8	" 65.9 " 86.1	" 2.4 " 5.5
Upper Mississippi valley.....	" 10 " 14	" 6 " 12	" 60.7 " 73.6	" 10.7 " 32.5
Missouri valley.....	" 8 " 16	" 5 " 7	" 66.0 " 75.8	" 9.7 " 24.0
Northern slope.....	" 3 " 11	" 5 " 12	" 48.0 " 74.0	" 15.3 " 21.7
Middle slope.....	" 5 " 11	" 2 " 6	" 61.3 " 67.7	" 19.4 " 25.6
Southern slope.....	" 6 " 7	" 5 " 6	" 63.0 " 71.9	" 33.9 " 38.0
Southern plateau.....	" 2 " 10	" 3 " 7	" 55.9 " 70.5	" 28.3 " 35.3
Northern plateau.....	" 3 " 15	" 8 " 10	" 73.2 " 83.5	" 26.3 " 27.9
North Pacific coast.....	" 13 " 24	" 10 " 13	" 83.3 " 86.6	" 35.4 " 40.2
Middle Pacific coast.....	" 3 " 9	" 4 " 5	" 79.3 " 88.5	" 37.6 " 44.2
South Pacific coast.....	" 6 " 7	" 2 " 5	" 63.8 " 64.7	" 42.0 " 43.6
Mt. Washington, N. H.....	Twenty-one	Nine	81.6	6.7
Pike's Peak, Col.....	Nine	Two	80.6	3.3

* Relative humidity corrected for altitude.

WINDS.

The most frequent directions of the wind during December, 1883, at the Signal Service stations are shown on chart iii. by arrows flying with the wind. On the Atlantic coast north of Virginia the prevailing winds were from the north and northwest, except at New York City, where they were southwest; on the south Atlantic coast, from northeast and southwest; along the immediate Gulf coast, from the north; in the lower lake region and Ohio valley, from south and southwest; in Tennessee, from south and southeast; in the upper lake region, upper Mississippi and Missouri valleys, from north to west; in Oregon and Washington Territory, from southeast to southwest; in southern California, from northeast.

TOTAL MOVEMENTS OF THE AIR.

[In miles.]

In the following table are given the stations reporting the largest and smallest total movements of the air in each of the various districts:

Districts.	Stations reporting largest.	Miles.	Stations reporting smallest.	Miles.
New England.....	Block Island, R. I.....	13,367	New Haven, Conn.....	5,800
Middle Atlantic states.....	Cape May, N. J.....	12,615	Lynchburg, Va.....	2,365
South Atlantic states.....	Kitty Hawk, N. C.....	10,034	Augusta, Ga.....	1,723
Florida peninsula.....	Key West.....	6,606	Sanford.....	3,686
East Gulf states.....	New Orleans, La.....	5,556	Montgomery, Ala.....	2,787
West Gulf states.....	Indianola, Tex.....	10,326	Little Rock, Ark.....	3,844
Ohio valley.....	Louisville, Ky.....	6,433	Cincinnati, Ohio.....	3,986
Tennessee.....	Nashville.....	4,935	Chattanooga.....	4,250
Lower lakes.....	Buffalo, N. Y.....	9,955	Toledo, Ohio.....	6,697
Upper lakes.....	Milwaukee, Wis.....	10,132	Chicago, Ill.....	5,945
Extreme northwest.....	Saint Vincent, Minn.....	7,746	Fort Buford, Dak.....	5,304
Upper Mississippi valley.....	Springfield, Ill.....	7,692	Saint Paul, Minn.....	3,883
Missouri valley.....	Omaha, Neb.....	7,076	Fort Bennett, Dak.....	4,304
Northern slope.....	Cheyenne, Wyo.....	7,914	North Platte, Neb.....	4,686
Middle slope.....	Fort Elliott, Texas.....	8,472	West Las Animas, Colo.....	5,835
Southern slope.....	Fort Concho, Tex.....	6,094	Fort Stockton, Tex.....	3,552
Southern plateau.....	Fort Grant, Ariz.....	6,097	El Paso, Tex.....	3,105
Northern plateau.....	Dayton, Wash. T.....	3,708	Lewiston, Idaho.....	1,543
North Pacific coast.....	Fort Canby, Wash. T.....	8,933	Roseburg, Oreg.....	1,724
Middle Pacific coast.....	Cape Mendocino, Cal.....	11,895	Sacramento, Cal.....	2,845
South Pacific coast.....	Los Angeles, Cal.....	4,391	San Diego, Cal.....	4,034

* For thirty days.

On the summits of Mount Washington and Pike's Peak the total movements of the air were 29,035 and 17,409 miles, respectively, the record at the former station being incomplete on account of frost-work.

HIGH WINDS.

On the summit of Mount Washington velocities of fifty miles or more per hour occurred on the following dates: from

1st to 19th, 22d to 29th. The highest velocities recorded were: 80, nw., 2d; 100, nw., 3d; 90, nw., 15th; 88, w., 18th; 108, nw., 22d; 124, nw., 23d; 80, nw., 29th. The maximum velocity for the month occurred on the 28th; at 12.54 p. m. the registering instrument was blown away, and it was not possible to replace it during the hurricane; a velocity of 132 miles per hour was recorded by holding the anemometer before the wind; the observer estimates the maximum velocity at 150 miles.

On the summit of Pike's Peak velocities of fifty miles or more per hour occurred on the 15th, 16th, 17th, 19th, 21st, 24th to 28th. The highest velocities recorded were as follows: 76, nw., 17th; 76, w., 21st; 96, w., 25th (maximum for the month); 74, w., 28th.

At Cape Mendocino, California, the highest velocities were: 64, se., 2d; 50, se., 23d; 60, se., 24th; 54, se., 26th; 72, se., 27th (maximum for the month).

Other stations reporting wind-velocities of fifty miles or more per hour, are as follows:

Fort Custer, Montana, 72, nw., 17th, and 72, w., 25th.

Cape May, New Jersey, 61, w., 28th.

Barnegat City, New Jersey, 59, nw., 28th.

Moorhead, Minnesota, 56, nw., 7th.

Fort Canby, Washington Territory, 56, s., 26th.

Sandusky, Ohio, 56, nw., 18th.

Sandy Hook, New Jersey, 56, nw., 28th.

Block Island, Rhode Island, 55, nw., 28th.

Cheyenne, Wyoming, 52, nw., 17th.

Fort Shaw, Montana, 52, sw., 27th.

Chincoteague, Virginia, 50, nw., 28th.

LOCAL STORMS.

Key West, Florida, 15th.—During a gale ("norther") the s. s. "Alarm" was blown against the Government wharf and had a hole stove in her side.

Idaho Springs, Clear Creek county, Colorado, 17th.—A violent storm prevailed in the morning. Several small houses were blown down, resulting in damage estimated at \$5,000.

Fort Collins, Larimer county, Colorado.—A very destructive storm passed over this part of the state on the 17th. About a dozen residences at this place were more or less injured. The damage resulting from the storm in Larimer county is estimated at \$10,000.

Ashland, Jackson county, Oregon.—On the night of the 23-24th, in mountains between this place and Linkville, Lake county, one of the severest storms occurred that has been experienced for many years. About thirty miles of the government telegraph line were prostrated.

Dr. G. G. Whitcomb, of Ogretta, Cherokee county, North Carolina, reports that at 8.30 p. m. of the 24th a violent storm occurred five miles north of that place, passing over the tops of the mountains at an elevation of 2,300 feet. The cloud was funnel-shaped and passed from west-northwest eastwardly. Hail, sleet, and snow followed after the storm had passed, or seemed to be thrown from it. As the country over which it passed is sparsely settled but little damage was done, other than that sustained by the forests. The movement of the clouds toward the path of the storm was observed at a distance of three miles.

New Haven, Connecticut.—During the night of the 24-25th the brig "Ellen Maria" was blown ashore on Fisher's island. She was valued at \$10,000, and proved almost a total loss. The schooner, "Laura" went ashore at Millstone point on the morning of the 25th; she was hauled off by the wreckers, having sustained damage to the extent of \$800.

Fort Klamath, Lake county, Oregon.—A violent southwest-erly wind and rain storm passed over that place on the afternoon of the 25th, uprooting trees and blowing down several miles of telegraph-line.

Savannah, Georgia.—A violent thunder-storm occurred here during the early morning of the 27th. It approached this city from the west, following the course of the Savannah river. At 4 a. m. the city was aroused by the most unusual and violent

detonations. They were preceded by very vivid flashes of lightning of various colors, the interval between the flashes and the report being almost imperceptible. For about one hour and forty-five minutes (during which time no rain fell) the reports continued in rapid succession. At 5.45 a. m. it began to rain and the electrical disturbances ceased. Heavy showers of rain continued at intervals until 12.15 p. m., when it cleared off, the rainfall amounting to 1.26 inches. No damage resulted from the storm in this vicinity. For several days preceding the storm the atmosphere was noticeable for its unusual sultriness, and at 2 a. m. of the 27th the sky was overspread with a thin film, forming faint halos around the more brilliant stars. The thickness of the clouds rendered it intensely dark for an hour after the time for daylight.

New York City.—During the storm of the 28th numerous signs and chimneys were blown down, and vessels in the harbor dragged anchor. Other slight damage was reported from surrounding localities.

Pittsfield, Berkshire county, Massachusetts.—A violent westerly gale prevailed here on the 28th. Many trees and chimneys were blown down, and the roofs of several buildings were blown off. Buildings were also damaged at East Douglass and Milford, in Worcester county.

Sandy Hook, New Jersey.—The schooner "Kate E. Gilford" was blown ashore at 4 a. m. of the 28th; she was hauled off on the 30th, having sustained but slight injury.

Narragansett Pier, Rhode Island.—The schooner "Belle O'Neal" was driven ashore one mile north of Whole Rock light-house during a westerly gale at 4 a. m. of the 27th; she was hauled off at 8 p. m. of the same date, being damaged to the extent of \$300.

NAVIGATION.

STAGE OF WATER IN RIVERS.

The Ohio river at Pittsburg, Pennsylvania, rose eleven feet and eight inches during the forty-eight hours ending at 2 p. m. on the 25th, and on that date reached its highest stage—eighteen feet and nine inches above low-water mark—or within one foot and three inches of the danger-line. It fell rapidly during the 26th and 27th, and, on the 31st it had fallen to six feet and four inches. The lowest stage of the month, two feet and ten inches, occurred on the 10th.

At Cincinnati, Ohio, the Ohio river rose seventeen feet and nine inches during the twenty-four hours ending at 2 p. m. of the 24th, and during the succeeding twenty-four hours it rose nine feet and four inches; it continued to rise until the 28th, on which date it reached a height of forty-nine feet and six inches above low-water mark, or within six inches of the danger-line. By 2 p. m. of the 29th it had fallen two feet below the highest point reached, and continued falling uninterruptedly until the close of the month, when it was eight feet below the highest point reached on the 28th. The lowest stage recorded during the month, ten feet and one inch, occurred on the 13th.

At Louisville, Kentucky, the Ohio rose steadily from the 24th to the 29th, reaching a point nine inches above the danger-line on the latter date; it was lowest, and stationary, from the 13th to 15th.

The Mississippi river at Saint Paul, Minnesota, was frozen from the 1st to the 10th, and from the 14th to the 31st; at La Crosse, Wisconsin, from the 16th to the 31st, and at Dubuque, Iowa, from the 18th to 31st. On the 26th an ice-dam formed in the river above Keokuk, Iowa, causing the water at that place to fall below low-water mark of 1864. The highest water at Keokuk, Iowa, five feet and nine inches, occurred on the 30th. At Saint Louis, Missouri, the highest water occurred on the 1st; at Cairo, Illinois, and Memphis, Tennessee, on the 31st; at Vicksburg, Mississippi, on the 8th and 9th; and at New Orleans, Louisiana, on the 11th and 12th. The Mississippi reached its lowest stage, at all stations between Keokuk and New Orleans, from the 21st to 31st.

The Missouri river continued low throughout the month. At Yankton, Dakota, it was frozen from the 16th to the 31st, and at Omaha, Nebraska, on the 30th and 31st.

The greatest ranges occurring in any of the rivers during the month are thirty-five feet and nine inches in the Ohio at Cincinnati, Ohio: twenty-seven feet and eleven inches in the Cumberland at Nashville, Tennessee; twenty feet and seven inches in the Mississippi at Cairo, Illinois; eighteen feet and eleven inches in the Ohio at Louisville, Kentucky.

In the following table are shown the danger-points at various river stations; the highest and lowest stages for December, 1883, with the dates of occurrence; and the monthly ranges:

Heights of rivers above low-water mark, December, 1883.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>	<i>Ft. In.</i>		<i>Ft. In.</i>		<i>Ft. In.</i>	<i>Ft. In.</i>
Shreveport, Louisiana.....	29 9	25	14 2	6	8 1	6 1
<i>Arkansas:</i>						
Little Rock, Arkansas.....	33 0	9	17 6	29	5 7	11 11
Fort Smith, Arkansas.....		7	8 8	31	—2 0	10 11
<i>Missouri:</i>						
Yankton, Dakota †.....	20 0	15	1 5	1 10 5	0 9	6 0
Omaha, Nebraska †.....	16 0	29	5 1	9 10 14	2 10	2 3
Leavenworth, Kansas.....	21 0	15, 10	5 2	26	2 3	2 11
<i>Mississippi:</i>						
Saint Paul, Minnesota †.....	18 6	12	2 7	11, 13	2 6	0 1
La Crosse, Wisconsin †.....	18 0	9, 10	2 0	1, 2, 3	1 2	0 10
Dubuque, Iowa †.....	21 10	10	4 7	5, 9	3 0	1 7
Bavenport, Iowa.....	15 0	14, 15	3 2	6	2 1	1 1
Keokuk, Iowa †.....	14 6	30	5 9	21	—0 6	6 5
Saint Louis, Missouri.....	36 0	1	10 5	29	4 6	5 11
Cairo, Illinois.....	19 0	31	33 9	22	13 2	20 7
Memphis, Tennessee.....	34 0	31	23 2	23	8 9	14 5
Vicksburg, Mississippi.....	41 0	8, 9	29 9	29	18 6	11 3
New Orleans, Louisiana *.....	—2 0	11, 12	—7 0	31	—10 5	3 5
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	20 6	25	18 9	8	2 10	15 11
Cincinnati, Ohio.....	50 0	28	49 0	13	10 1	39 5
Louisville, Kentucky.....	24 0	29	24 9	13, 14, 15	5 10	18 11
<i>Cumberland:</i>						
Nashville, Tennessee.....	42 0	28	33 9	7	5 10	27 11
<i>Tennessee:</i>						
Chattanooga, Tennessee.....	33 0	28	13 0	7, 8	2 6	10 6
<i>Manongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	25	18 9	8	2 10	15 11
<i>Savannah:</i>						
Augusta, Georgia.....	30 0	10	9 2	8, 9	5 0	4 2
<i>Willamette:</i>						
Portland, Oregon.....		29	10 8	24	1 5	9 3
<i>Sacramento:</i>						
Red Bluff, California.....		26	3 0	1 to 24	0 10	2 2
Sacramento, California.....		29	9 10	18 to 23	7 0	2 10
<i>Mobile:</i>						
Mobile, Alabama.....		7	15 8	15	12 0	3 8
<i>Colorado:</i>						
Yuma, Arizona.....						

* Below high-water marks of 1874 and 1883. † On 22d, below any mark on gauge. ‡ Observations interrupted by ice; see text.

ICE IN RIVERS AND HARBORS.

Penobscot river.—Bangor, Maine: navigation closed on the 16th; the "Katahdin" was the last steamer to leave this port.

Kennebec river.—Gardiner, Maine: the river froze over on the 23d.

Lake Whitney.—New Haven, Connecticut: the lake froze over on the 16th.

Hudson river.—Albany, New York: the river froze over at this place on the 16th. The last steamer to leave here was the "Drew"; and the steamer "Ellen M. Rowan" was the last boat to arrive, having forced her way through the ice on the 17th. On the 22d, the river was filled with ice from Rhinebeck southward to Poughkeepsie, and navigation north of the latter city was practically closed, although the main channel remained open from Poughkeepsie to Roundout. North of Roundout the river was closed. North of Catskill the ferry boats ceased running, and people crossed on the ice on that date. From Poughkeepsie southward the river was almost entirely free of ice, none being visible except in the vicinity of Poughkeepsie. North of Hudson the ice was five inches thick.

New York City: floating ice was observed in the river on the 21st and 24th.

Lake Ontario.—Oswego, New York: the steam barge "Saxon" left port on the 11th, being the last departure of the season. On the 22d the Oswego river was frozen over from the head of the island to the lower bridge.

Niagara river.—Buffalo, New York: the river froze over on the 24th.